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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,169	11/28/2001	Jeremy Paul Kramskoy	048487-9053	2095
3000	7590	09/21/2004	EXAMINER	
CAESAR, RIVISE, BERNSTEIN, COHEN & POKOTILOW, LTD. 11TH FLOOR, SEVEN PENN CENTER PHILADELPHIA, PA 19103-2212			NGUYEN, VAN H	
			ART UNIT	PAPER NUMBER
			2126	

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/996,169		KRAMSKOY, JEREMY PAUL	
	Examiner		Art Unit	
	VAN H NGUYEN		2126	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/21/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-20 are presented for examination.

Specification

2. The abstract of the disclosure is objected to because it exceeds the limit of 150 words.

Correction is required. See MPEP § 608.01(b).

Claim Objections

3. Claims 2-5, 7-13, and 15-20 are objected to because of the following informalities:

(i) Dependent claims 2-5 should begin with "the method" as they are referred to "a method" of independent claim 1.

(ii) Dependent claims 7-13 should begin with "the method" as they are referred to "a method" of independent claim 6.

(iii) Dependent claims 15-20 should begin with "the execution system" as they are referred to "an execution system" of independent claim 14.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following phrases lack antecedent basis:

- (i) "the stack frame template" (claim 1, lines 4-5 and claim 6, lines 6-7)
- (ii) "the method's exact stack requirements" (claim 1, lines 6-7 and claim 6, lines 8-9)
- (iii) "the execution speed" (claim 14, line 1)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made

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7. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Alexandria, III et al.** (U.S. 6,507,946) in view of **Blandy et al.** (U.S. 6,654,778).

8. As to claim 14, Alexandria teaches the invention substantially as claimed including an execution system for increasing the execution speed of invoking Methods of one or more classes (abstract, lines 1-2 and col.1, lines 9-10), the system comprising:

memory (424; col.5, line 35 and fig.4); and

a virtual machine (400; col.5, lines 27-30 and fig.4) operable to access the memory, to create a representation of at least one of the Methods based on an activation stack frame template with a set of criteria (col.5, lines 46-57), to create a representation of at least one of the Methods based on exact stack requirements (col.5, lines 57-60), and to spatially associate a Method access structure contiguous to the representation of each of the Methods (col.6, lines 13-19).

Alexandria does teach a Java virtual machine 400 including Execution engine 406 for executing instructions contained in the methods of classes loaded by class loader subsystem 402 (col.5, lines 29-38), but does not explicitly teach creating a Method routing structure for each of the one or more classes.

Blandy teaches creating a Method routing structure for each of the one or more classes (col.6, lines 9-14).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Blandy with Alexandria because Blandy's teachings would have provided the capability for insuring that the parameters are passed appropriately to the target method, avoiding function activation and interpretation overhead for

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calls to selected methods in the Java virtual machine interpreter. Therefore, program execution speed is greatly improved.

9. As to claim 15, Alexandria teaches the set of criteria includes the number of parameter words, the total number of local words, and the number or words of evaluation stack (fig.5B and associated text).

10. As to claim 16, Alexandria teaches the activation frame template includes a local variable portion (col.5, line 53), an evaluation stack (col.5, lines 55-57), and a fixed size frame linkage structure (col.6, lines 55-60).

11. As to claim 17, Alexandria does teach a Java virtual machine 400 including Execution engine 406 for executing instructions contained in the methods of classes loaded by class loader subsystem 402 (col.5, lines 29-38), but does not explicitly teach associating a pointer with each Method access structure, the pointer defined such that it is an indicator of where code for implementing a Method resides and an indicator for the Method itself.

Blandy teaches associating a pointer with each Method access structure, the pointer defined such that it is an indicator of where code for implementing a Method resides and an indicator for the Method itself (col.6, lines 24-31).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Blandy with Alexandria because Blandy's teachings would have provided the capability for insuring that the parameters are passed appropriately to the target method.

12. As to claim 18, Alexandria teaches the virtual machine is operable to maintain Method access structures associated with dynamically compiled code in an area of memory separate from

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Method access structures associated with bytecode (col.5, lines 16-26).

13. As to claim 19, Alexandria does not explicitly teach the Method routing structure includes one or more misaligned pointers to denote processor executable Method access structures.

Blandy teaches the Method routing structure includes one or more misaligned pointers to denote processor executable Method access structures (col.6, lines 9-14).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Blandy with Alexandria because Blandy's teachings would have provided the capability for insuring that the parameters are passed appropriately to the target method.

14. As to claim 20, Alexandria teaches the virtual machine is operable to spatially associate the Method access structure immediately preceding the representation of each of the Methods (col.6, lines 13-19).

15. As to claim 1, Alexandria teaches the invention substantially as claimed including a method of increasing the execution speed of invoking and returning from a Method while reducing the supporting memory footprint (abstract, lines 1-2 and col.1, lines 9-10), the method comprising:

establishing an activation stack frame template with a set of criteria (col.5, lines 47-55);

determining whether the Method conforms to the criteria of the stack frame template (col.7, lines 23-32);

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creating a fixed size activation frame regardless of the Method's exact stack requirements, based on the set of criteria of the activation stack frame template if the Method conforms to the set of criteria of the activation stack frame template (fig.5B and associated text); and

associating a Method access structure with the Method such that the Method access structure is contiguous with the code of the Method (col.6, lines 13-19).

Alexandria does teach an activation frame (col.6, lines 32-37) and the activation stack frame template, but does not explicitly teach an activation frame to match the Method's exact stack requirements if the Method does not conform to the set of criteria of the activation stack frame template.

Blandy teaches an activation frame to match the Method's exact stack requirements if the Method does not conform to the set of criteria of the activation stack frame template (col.7, lines 21-51).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Blandy with Alexandria because Blandy's teachings would have provided the capability for avoiding function activation and interpretation overhead for calls to selected methods in the Java virtual machine interpreter. Therefore, program execution speed is greatly improved.

16. As to claims 2-4, note the rejection of claims 15-17 above. Claims 2-4 are the same as claims 15-17, except claims 2-4 are method claims and claims 15-17 are system claims.

17. As to claim 5, Alexandria teaches the Method access structure is variably sized (fig.5A and associated text).

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18. As to claim 6, the rejection of claim 1 above is incorporated herein in full. Alexandria, however, does not explicitly teach creating a Method routing structure for each class; and rewriting invocation bytecodes to a form that includes an indication of the Method routing structure.

Blandy teaches creating a Method routing structure for each class (col.6, lines 9-14); and rewriting invocation bytecodes to a form that includes an indication of the Method routing structure (col.8, lines 16-18).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Blandy with Alexandria because Blandy's teachings would have provided the capability for avoiding the overhead involved with function activation and interpretation of the methods. Therefore, increasing performance in execution of methods.

19. As to claims 7-11, note the rejection of claims 15-19 above. Claims 7-11 are the same as claims 15-19, except claims 7-10 are method claims and claims 15-19 are system claims.

20. As to claim 12, refer to the discussion of claim 19 above for rejection of "the misaligned pointers are used to denote processor executable Method access structures." Additionally, Blandy further teaches one or more aligned pointers are used to denote processor non-executable Method access structures (col.6, lines 25-28).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Blandy with Alexandria because Blandy's teachings would have provided the capability for increasing performance in execution of

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methods by avoiding the overhead involved with function activation and interpretation of methods.

21. As to claim 13, refer to claim 5 above for rejection.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Berstis (U.S. 6631515) teaches "Method and apparatus to reduce code size and runtime in a Java environment."

- Yellin et al. (U.S. 6477702) teaches "Bytecode program interpreter apparatus and method with pre-verification of data type restrictions and object initialization."

- Griesemer (U.S. 6192516) teaches "Interpreter generation and implementation utilizing interpreter states and register caching."

- Petrick (U.S. 6148391) teaches "System for simultaneously accessing one or more stack elements by multiple functional units using real stack addresses."

- Pletcher et al. (U.S. 5727178) teaches "System and method for reducing stack physical memory requirements in a multitasking operating system."

- Vijaykrishnan et al. "supporting object accesses in a Java processor" IEEE 2000, pp. 435-443.

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23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VAN H. NGUYEN whose telephone number is (703) 306-5971. **After mid-October, 2004, the examiner can be reached at (571) 272-3765.** The examiner can normally be reached on Monday-Thursday from 8:30AM - 6:00PM. The examiner can also be reached on alternative Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (703) 305-9678.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VHN


MENG-AI T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100